University of Zurich[UZH]

Zurich Open Repository and Archive
University of Zurich
University Library
Strickhofstrasse 39
CH-8057 Zurich
www.zora.uzh.ch

Year: 2016

Does Volume Translate in Function in Interstage Associating Liver Partition and Portal Vein Ligation for Staged Hepatectomy?: Commentary on "Drop of Total Liver Function in the Interstages of the New Associating Liver Partition and Portal Vein Ligation for Staged Hepatectomy Technique: Analysis of the Auxiliary Liver by Hepatobiliary Iminodiacetic Acid Scintigraphy"

Petrowsky, Henrik

DOI: https://doi.org/10.1097/SLA.0000000000001604

Posted at the Zurich Open Repository and Archive, University of Zurich
ZORA URL: https://doi.org/10.5167/uzh-125989
Journal Article
Published Version

Originally published at:
Petrowsky, Henrik (2016). Does Volume Translate in Function in Interstage Associating Liver Partition and Portal Vein Ligation for Staged Hepatectomy?: Commentary on "Drop of Total Liver Function in the Interstages of the New Associating Liver Partition and Portal Vein Ligation for Staged Hepatectomy Technique: Analysis of the Auxiliary Liver by Hepatobiliary Iminodiacetic Acid Scintigraphy". Annals of Surgery, 263(3):e35.
DOI: https://doi.org/10.1097/SLA.0000000000001604

Does Volume Translate in Function in Interstage Associating Liver Partition and Portal Vein Ligation for Staged Hepatectomy?

Commentary on ''Drop of Total Liver Function in the Interstages of the New Associating Liver Partition and Portal Vein Ligation for Staged Hepatectomy Technique: Analysis of the Auxiliary Liver by Hepatobiliary Iminodiacetic Acid Scintigraphy''

(*Ann Surg* 2016;263:e35)

The French group reported their experience with technetium (Tc99m)-labled hepatobiliary iminodiacetic acid (HIDA) scintigraphy assessing interstage hepatic function of the future liver remnant (FLR) and the deportalized liver in patients undergoing associating liver partition and portal vein ligation for staged hepatectomy (ALPPS). The report is based on a series of 5 patients with colorectal liver metastases (n = 4) and gallbladder carcinoma (n = 1) with right hepatectomy in 2 cases and extended right hepatectomy in 3 cases at stage-2 surgery. During ALPPS interstage, the authors observed an attenuation of hepatic function in the excluded liver and a concomitant increase of function in the FLR but total function dropped compared with prestage 1 function. Furthermore, percent volume increase after stage-1 surgery increased more pronounced compared with increase in function. The patient who died showed a sharp drop of function in the deportalized lobe whereas function of the deportalized lobe remained higher than in the FLR in all survivors.[1]

Truant et al state that one of the major criticisms of ALPPS is the associated high mortality rate, which is reported up to 12% even by experienced centers. Especially, the interstage function of the FLR plays an important role and determines outcome after stage-2 surgery.[1] The letter challenges us with the question ''*Does volume translate in function?*'' Obviously, volume measurement alone does not appear to be the only definitive determination whether to proceed safely with stage-2 surgery. Therefore, there is an urgent need for reliable and noninvasive tests to measure regional and global liver function during the interstage course of ALPPS. The authors advocate HIDA scintigraphy for adequate liver function assessment to select patients upfront for ALPPS or to delay stage-2 surgery until adequate function is reached.

HIDA scintigraphy was frequently used in the past as diagnostic tool for acute cholecystitis but is today increasingly used to assess liver function. The principle of HIDA relies on both hepatic uptake and biliary excretion function.[2] In contrast to other dynamic liver function tests, the main advantage of HIDA scintigraphy is its noninvasive ability to assess liver function for anatomic regions of interest. In other words, function can be separately measured for the right and left lobe. Although the indocyanine green clearance test can also measure function of regions of interest but this requires invasive access for ipsi- and contralateral inflow occlusion of the hemiliver. On the other hand, HIDA has also limitations especially in cholestatic conditions and might be therefore not suitable for patients with cholangiocarcinoma.

Although the present series presents only 5 patients, there is growing evidence in the hepatobiliary community that noninvasive HIDA scintigraphy may become a standard test for functional assessment of FLR before proceeding with major liver surgery. A recent study by the Dutch group showed that patients with FLR function below the threshold of 2.69%/min/m^2 had a high risk to develop postoperative liver failure after major hepatectomy.[3] In this study, 8 of 9 patients who developed postresection liver failure died. The prediction of postresection liver failure using the cutoff of 2.69%/min/m^2 had a high discriminatory ability with a *c*-statistic of 0.916. Whether the same cutoff applies to the interstage ALPPS liver function is unknown. A recently published study on ALPPS showed that postoperative liver failure was the leading cause for early mortality after stage-2 surgery.[4] Unfortunately, Truant et al did not report on specific functional data of the FLR. Beside the pure qualitative description of liver function of the deportalized liver and FLR, it would be of high interest if the authors would have provided data on quantitative liver function in their letter. In addition, the low case number (n = 5) and the mixture of ALPPS (n = 3) and salvage ALPPS (n = 2) are further limitations of the report. Furthermore, it is also difficult to draw valuable conclusions on 1 observation with lethal outcome. However, the authors point out a very important functional topic in ALPPS where no data have been published on interstage function assessment by HIDA scintigraphy. Therefore, this topic urgently needs further investigation to improve early outcome and avoid futility in ALPPS.

Henrik Petrowsky, MD, FACS
Department of Surgery and Transplantation
Swiss HPB and Transplant Center Zurich
University Hospital Zurich
Zurich, Switzerland
Henrik.petrowsky@usz.ch

REFERENCES

1. Truant S, Baillet C, Deshorgue AC, et al. Drop of total liver function in the inter-stages of the new associating liver partition and portal vein ligation for staged hepatectomy technique: analysis of the ''auxiliary liver'' by HIDA scintigraphy. *Ann Surg*. 2016;263:e33–e34.
2. De Graaf W, Bennink RJ, Vetelainen R, et al. Nuclear imaging technique for the assessment of hepatic function in liver surgery and transplantation. *J Nucl Med*. 2010;51:742–752.
3. De Graaf W, van Lienden KP, Dinant S, et al. Assessment of future remnant liver function using hepatobiliary scintigraphy in patients undergoing major liver resection. *J Gastrointest Surg*. 2010;14:369–378.
4. Schadde E, Raptis DA, Schnitzbauer AA, et al. Prediction of mortality after ALPPS stage-1: an analysis of 320 patients from the international ALPPS registry. *Ann Surg*. 2015;262:780–786.

Disclosure: The author declares no conflicts of interest.
Copyright © 2015 Wolters Kluwer Health, Inc. All rights reserved.
ISSN: 0003-4932/14/26105-0821
DOI: 10.1097/SLA.0000000000001604

Copyright © 2015 Wolters Kluwer Health, Inc. All rights reserved.